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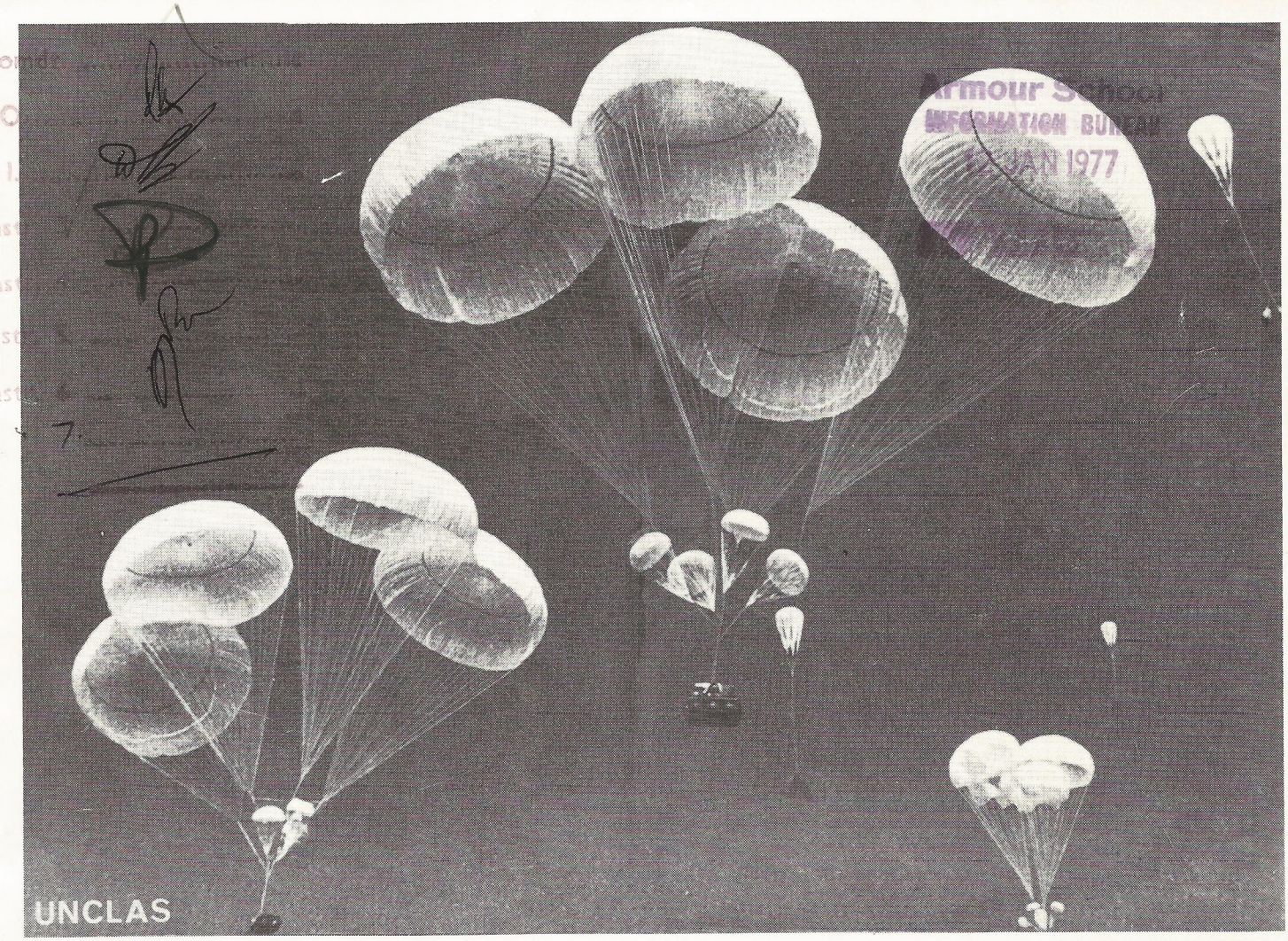
DEFENCE INTELLIGENCE STAFF

(Directorate of Scientific and Technical Intelligence)

ARMY TECHNICAL INTELLIGENCE REVIEW



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FOREWORD

The Soviets have the largest and best equipped airborne force in the world today and the first article in this Review surveys the wide range of aerial delivery equipment available to this force.

Many innovations have been made in the Soviet artillery area in the last few years and this is highlighted by the article on the impressive 122 mm self-propelled gun. On the other hand their target acquisition equipment is still weak in some areas as is shown by the reassessment of the rather dated sound ranging system that is still in service with the Soviet Army.

The emphasis on mobility within the Warsaw Pact ground forces is not restricted to the forward divisions only. An article surveying the range of line-of-communication bridging that they have developed illustrates that they are equally concerned with keeping open their supply lines in the rear areas. Also concerned with mobility is an illustrated description of the many and varied attachments mounted on Warsaw Pact tanks for the fitting of dozer blades and mine clearing ploughs and rollers. Two aspects of protection are covered in articles on the spread of NBC collective protective systems in the Warsaw Pact and the wide variety of methods used by the Warsaw Pact for producing smoke on the battlefield.

An article on the R-123M VHF vehicle radio set completes the coverage of the Soviet range of tactical VHF radios.

Finally the Review includes a brief note on a new member of the BMP family – a reconnaissance variant – that has recently appeared.

TB PALMER
Colonel Tech Int (A)

1. Soviet Aerial Delivery Equipment

Introduction

Air-drop equipment currently used by the Soviet Airborne Forces is of excellent design and high quality. Canopies of most personnel parachutes are of the conventional circular design, manoeuvrable, stable and reliable. A series of cargo parachutes, ranging from 8 to 30 metres in diameter, together with a family of light cargo drop containers, heavy drop platforms and retro rocket retardation systems provide the Soviets and their allies with a highly effective air-drop capability.

Personnel Parachutes

Significant progress in personnel parachute development has placed the USSR in a leading international position in this field. Considerable priority has been given to the design and employment of personnel parachutes for many years and the Soviets currently have a number of standard types, offering a wide range of characteristics for various missions.

The most common parachutes are the two stabilised free-fall assemblies, the D-1-8 and D-3. The addition of a small stabilising parachute, shown in Figure 1, that is deployed on exit from the aircraft, allows a non free-fall trained parachutist to descend to a predetermined altitude under control before the main canopy is deployed. This system allows the Soviets to jump from higher altitudes with less dispersion than would be the case if the main parachute was deployed immediately on exit.

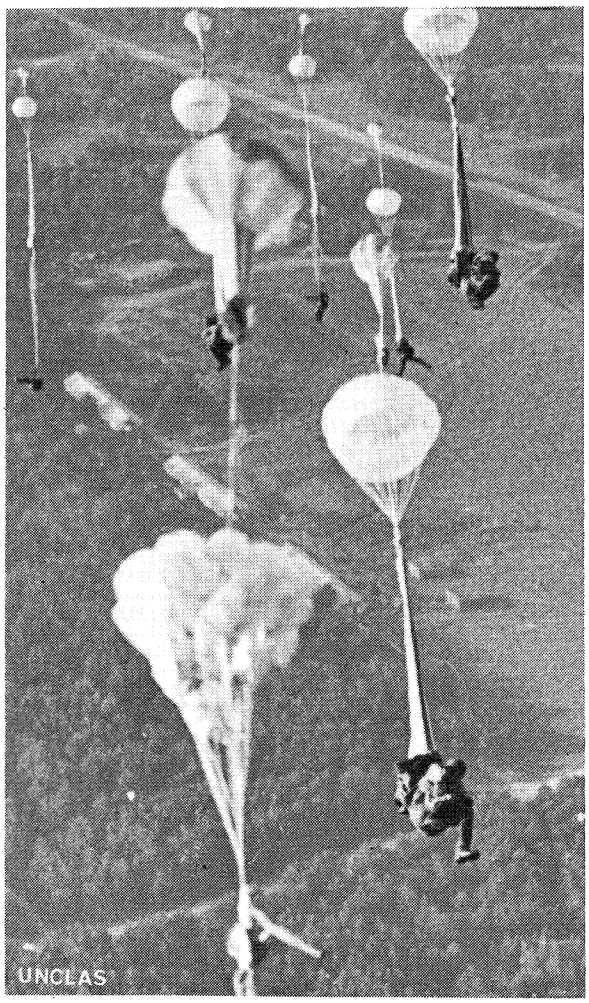


Fig 1. Personnel Parachute D-1

Cargo Parachutes

Light Cargo Parachutes. The principle standard light cargo parachute system currently in use in the USSR is the PG-125-47. The parachute is designed for air-dropping material weighing up to 140 kg; heavier cargoes can be dropped using a number of these parachutes.

Heavy Cargo Parachutes. Three sizes of cargo parachutes for dropping heavy equipment are believed to be in use in the Soviet Union. They are all of the flat, circular type and at least two are made of Capron, a material similar to Nylon. An unusual feature of the heavy drop parachute system

is the use of small stabilising parachutes, one for each main canopy, between the main drag producing surfaces and the cargo package (Fig 2). Two of these heavy drop assemblies, with an estimated diameter of 20 metres and a load capacity of 998 kg are used to air-drop the UAZ-69 light truck. A second type of cargo parachute, with an estimated diameter of 32 metres is used in groups of five to air-drop the GAZ-66B 2½ tonne truck.

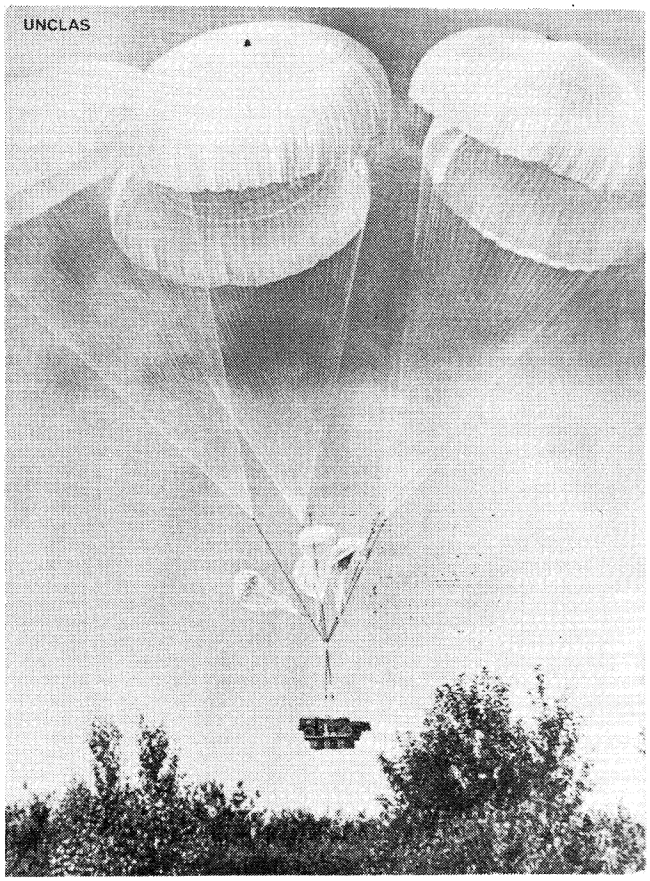


Fig 2. Using Small Stabilising Parachutes

Light Drop Equipment

In recent years the Soviets have displayed considerable interest in air-dropping light material and equipment. They have developed several standard light cargo aerial supply containers, such as the PDSB-1 used to drop POL (Fig 3). Rations, ammunition, fuel and general stores are all dropped using standard containers. Such containers are limited in capacity but characterised by simplicity, versatility, low cost and durability. New designs of container are continually being brought into service.

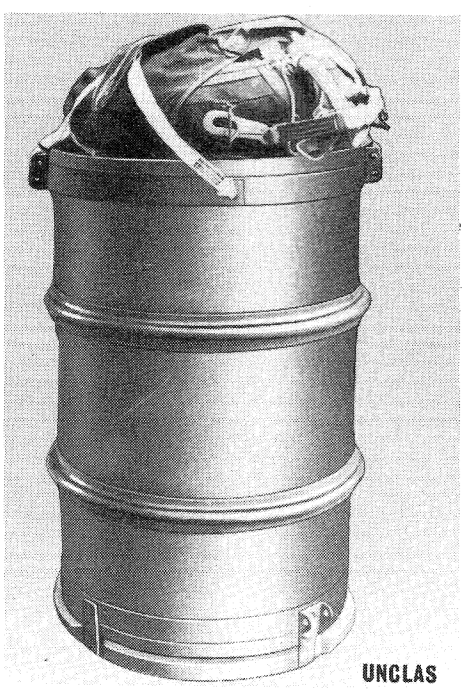


Fig 3. PDSB-1 Light Supply Container

Free Fall Containers. The Soviets have also shown some interest in developing inexpensive containers for air-dropping material without parachutes but no evidence exists that improved or standardised free-fall containers have been developed for military use. Such containers currently known to exist are, to a large extent, makeshift arrangements designed originally for civilian use in the Arctic. However, as the military significance of free-fall containers is readily apparent the Soviets may well introduce a military free-fall system at any time.

Heavy Drop Equipment

The first evidence of an active Soviet interest in the parachute dropping of heavy equipment appeared in Soviet publications in late 1962. Since then they have rapidly developed their heavy drop capability to the point where they now have the ability to drop light armoured vehicles without the use of a platform.

Cargo Platforms. An aerial delivery platform or pallet is used for dropping vehicles and heavy equipment. In this system the steel suspension slings are attached to the rectangular stressed platform rather than to the load. Therefore, equipment need not be specifically designed or modified for parachuting, less shock absorption material need be used and de-rigging times on the dropping zone are short. The main Soviet heavy drop platforms are the PP-127-3500 and the PP-128-5000 (Fig 4).

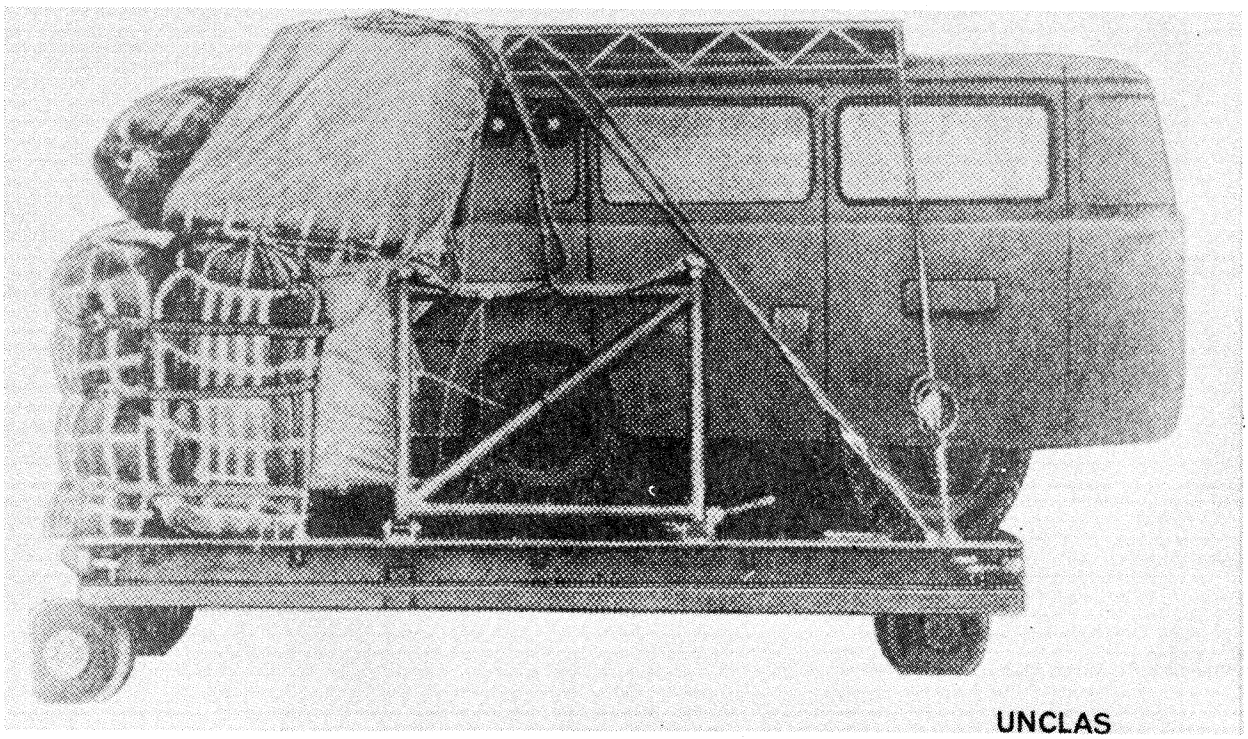


Fig 4. UAZ-450 Ambulance Rigged on PP-128-5000 Platform

Retro-Rocket Systems. The Soviets have in service two retro-rockets retardation systems; one is used with the PP-128-5000 heavy drop platform, and the other one when dropping vehicles without use of a platform of any type. Retro-rocket systems employ a number of small rockets that are fired when the load is about 10–15 m above the ground reducing the speed of descent to almost zero on landing. The major advantage of such a system is that fewer parachutes need to be used to drop heavy equipment, the parachutes being used more to stabilise the load than to retard the speed of descent, and equipment drops are less dispersed.

BMD Airdropping. The Soviets have developed the capability of airdropping the BMD (Airborne Infantry Combat Vehicle) without a platform of any type, using a retro-rocket system. This allows the BMD vehicle to be driven on to the aircraft where the suspension is adjusted such that the vehicle is resting on a conveyor rail in the aircraft. The BMD is extracted by an extractor parachute and when the vehicle is clear of the aircraft the single main chute is then deployed.(Fig 5). The retro-rocket system reduces the vertical speed such that the vehicle suspension can absorb the landing shock. The BMD is available for action immediately on landing.

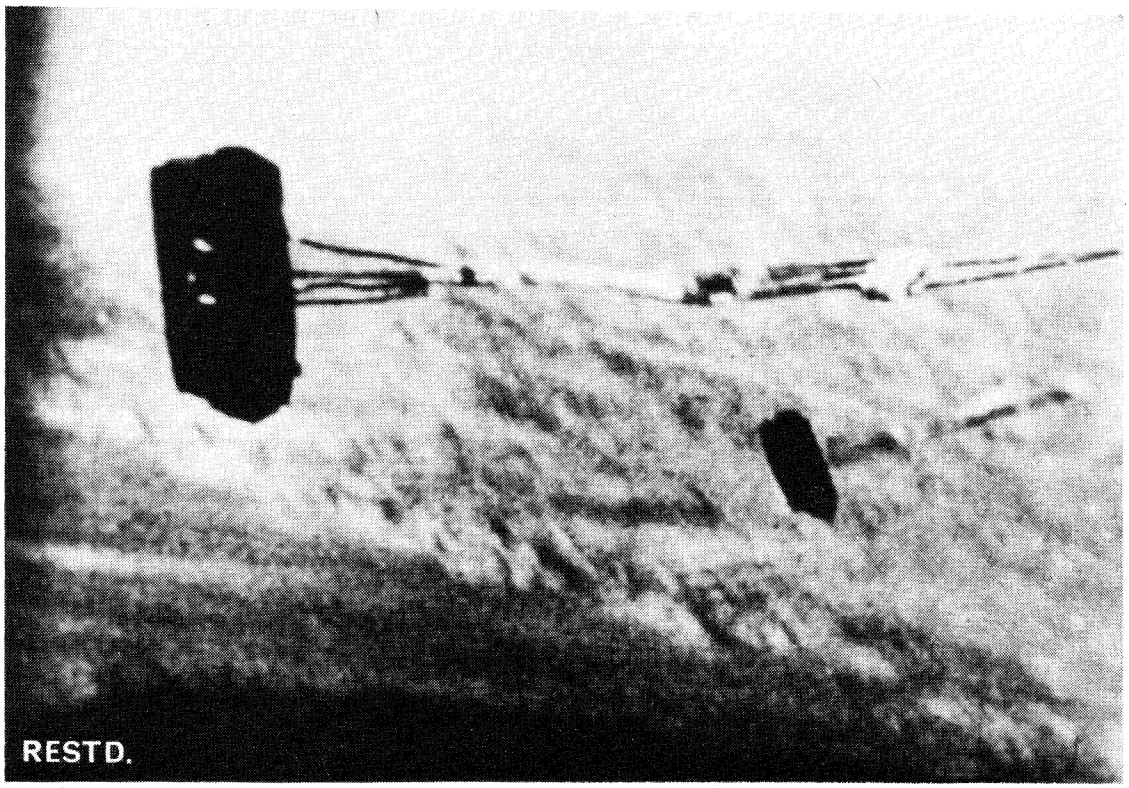


Fig 5. BMD without Platform showing Main Parachute Deployment

Conclusions.

The Soviets have the largest and by far the best equipped Airborne Force in the world. Their capability to land troops on a drop zone with reduced dispersion, combined with their ability of delivering support and fighting vehicles, with or without drop platforms indicates the emphasis they place on this element of their forces. The Soviet Airborne Forces have the capability of air dropping balanced forces that will be ready for action within moments of landing.

2. The Soviet 122mm SP Field Gun M-1974

Until 1973 the Soviets followed the policy of using only towed artillery pieces in support of their forces. Since then, however, they have introduced two tracked self-propelled guns into service.

The 122 mm M-1974 is the smaller of the two guns and is being deployed in batteries of six with those Motor Rifle Regiments which are equipped with BMP.

Fig 1. 122 mm SP Gun M-1974

It is a well designed modern weapon based on a proven field gun, the 122 mm HOW D-30 (Fig 2). The gun has a range of 17 km which can be increased to 24 km by using a rocket assisted projectile. It will fire high explosive, smoke, illuminating, chemical and armour defeating rounds. The turret can be traversed through 360 degrees with elevation limits from -5 degrees to +65 degrees. Because of the limited size of the turret it is believed that the ammunition, which is separate loading, will be automatically loaded and ejected, and this should enable the gun to fire at a maximum rate of 7 to 8 rds/min with a possible burst rate of 5 rounds in the first 30 seconds.

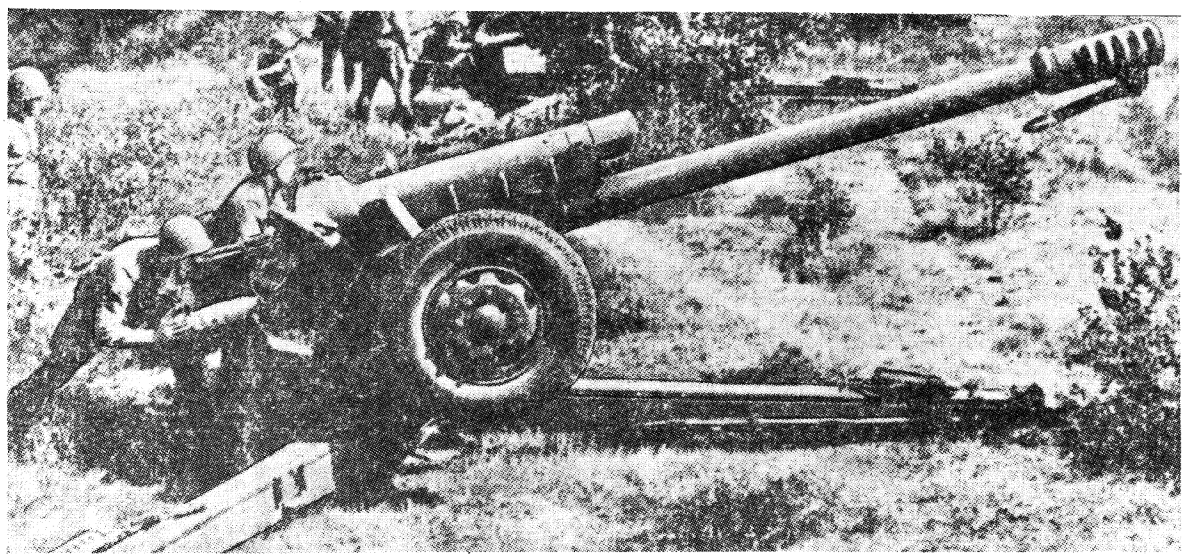


Fig 2. 122 mm Howitzer D-30

The turret is lightly armoured and will only offer protection to the crew against small arms fire and shrapnel. It has full NBC collective protection installed, is amphibious and light enough to be airportable. It is only large enough for a crew of four, driver, gunner, gun layer and detachment commander. Other ammunition numbers from the attached ammunition vehicle will be used when the gun is in a static position.

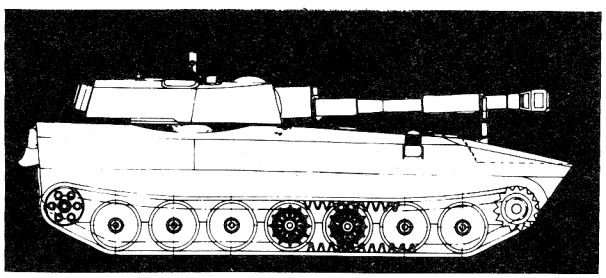
The M-1974 has a good cross country performance with speeds of up to 60 kph on good roads and 35 kph over rough terrain. To assist it when swimming it has track covers which hook onto the forward fenders to control the stability in the water, though these are stored behind the turret on the rear bustle when not in use. It also has slatted louvres at the rear of the tracks which hinge down to break up the wake.

Conclusion

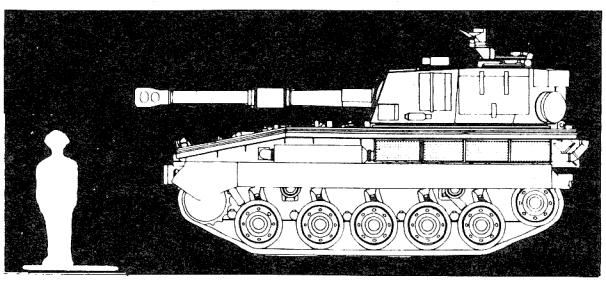
The addition of this SP gun will greatly enhance the fire support which a Motor Rifle Regiment can give to operations. The cross country mobility of the guns will enable them to operate from a greater choice of fire positions, and to change these fire positions frequently, and the protection they give to the crews will make them less vulnerable to counter bombardment and more able to operate in a direct fire role.

Characteristics

Calibre	122 mm
Weight fully loaded	18 tonnes
Length	7.1 m
Width	2.95 m
Height	2.4 m
Elevation	-5° to +65°
Traverse	360°
Ammunition types	HE, SMK, ILL, CHEM, HEAT
Range	17,000 m, 24,000 m RAP
Rate of fire	7 to 8 rounds per min
Muzzle velocity	690 m/s



122 mm
M-1974



105 mm
ABBOT

RESTD.

Fig 3. Comparison with the UK ABBOT 105 mm SP Gun

3. Soviet R-123M VHF Vehicle Radio Set

The R-123M is fully compatible with the R-111 high power vehicle set and the R-107 manpack set (ATIR 107 and 108 respectively) and together these three sets form a range of tactical VHF radios which are widely deployed in the Soviet Ground Forces.

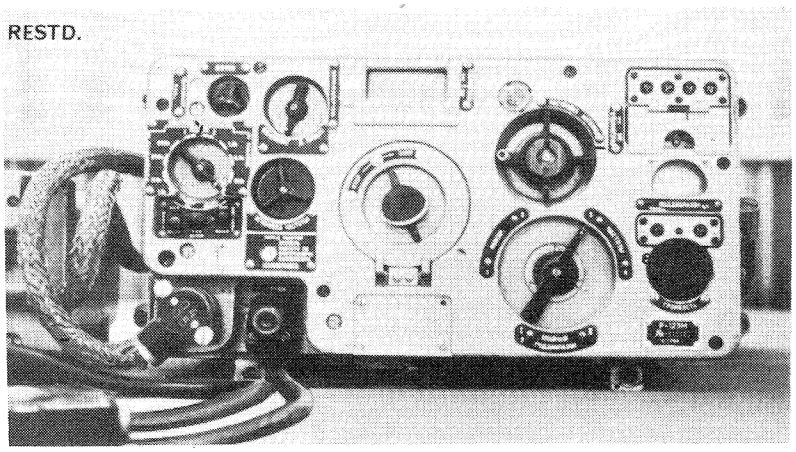


Fig 1. R-123M Radio Set

The R-123M is the VHF radio currently in use in Soviet AFVs. In common with other Soviet radios, the operator can preset four frequencies and frequency changing is performed automatically by the set.

The radio set itself uses miniature rod valves which are common to many Soviet radios, however both the power supply unit and intercom unit are transistorized.

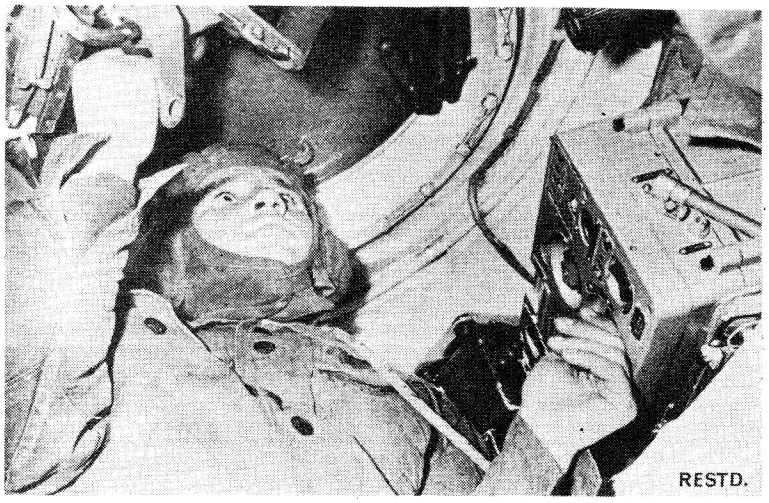


Fig 2. R-123M installed in AFV

Technical Characteristics

Frequency Range		20–51.5 MHz
Channel Spacing		25 kHz
Power Output		20 W
Type of Modulation		FM
Power Supply		24 Volt vehicle battery
Antenna		Whip
Dimensions:	Length	30 cm
	Width	20 cm
	Height	21 cm
Weight		22 kg

4. Warsaw Pact Lines of Communication Bridging

The very heavy consumption of combat supplies and materials in any war in Europe, and the relative ability of each side to maintain and resupply its field forces could be crucial. It is becoming evident that the Warsaw Pact armies have long considered this factor and that considerable development effort has been put into the production of improved line of communication bridges in order to replace damaged bridges.

Soviet engineers first faced such problems during World War II and they have great experience of building road and rail bridges over large rivers. In those days they used timber bridging with timber pile supports. In the post war years various types of sectional equipment bridging were introduced and the modern equivalents of these are the MARM light sectional bridge (Fig 1) and the SARM medium sectional bridge (Fig 2). With these the length of clear span was increased but the bridging is still dependent upon timber piles or on equipment crib piers both of which take time to construct.

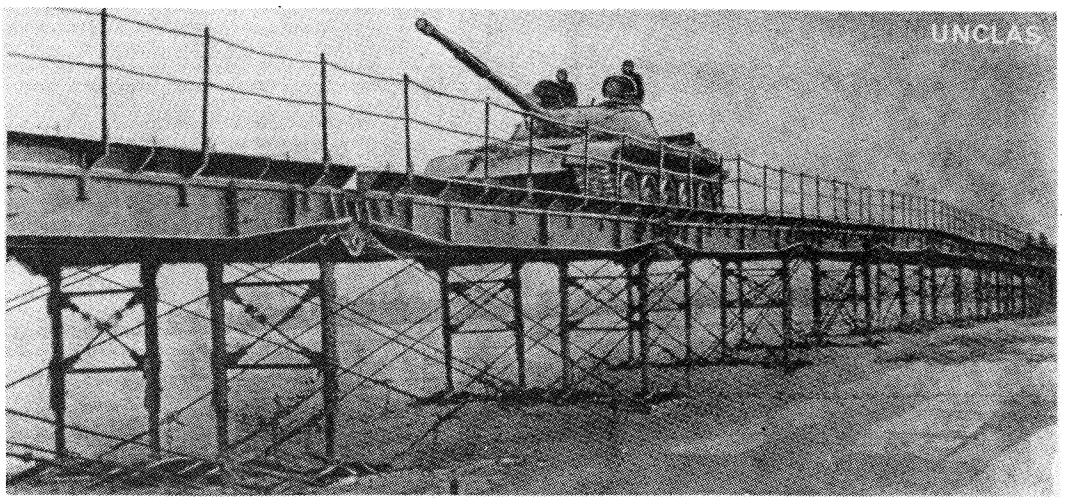


Fig 1. Light Sectional Bridge MARM

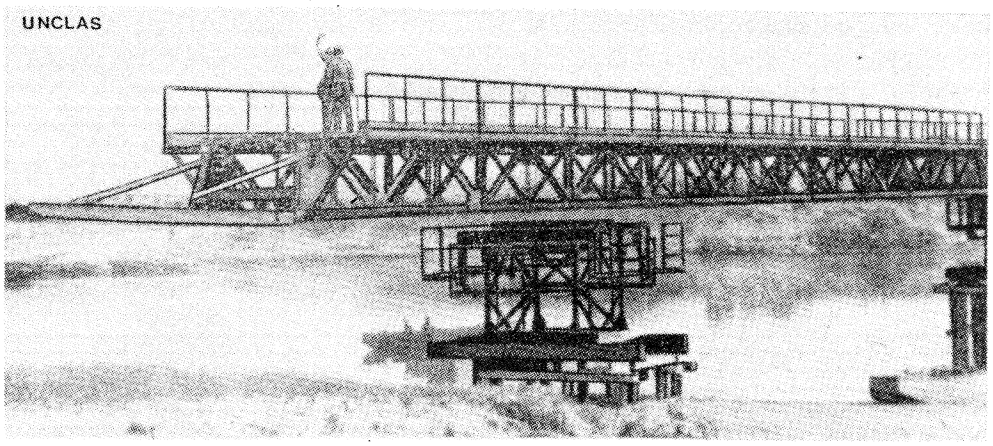


Fig 2. Medium Sectional Bridge SARM

Multiple pile drivers mounted on special pontoons were one solution suited to Russian expertise. A further step was the production of specialised adjustable trestle piers; these could fit the standard river barges and could also be used on bridge approaches in shallow water.

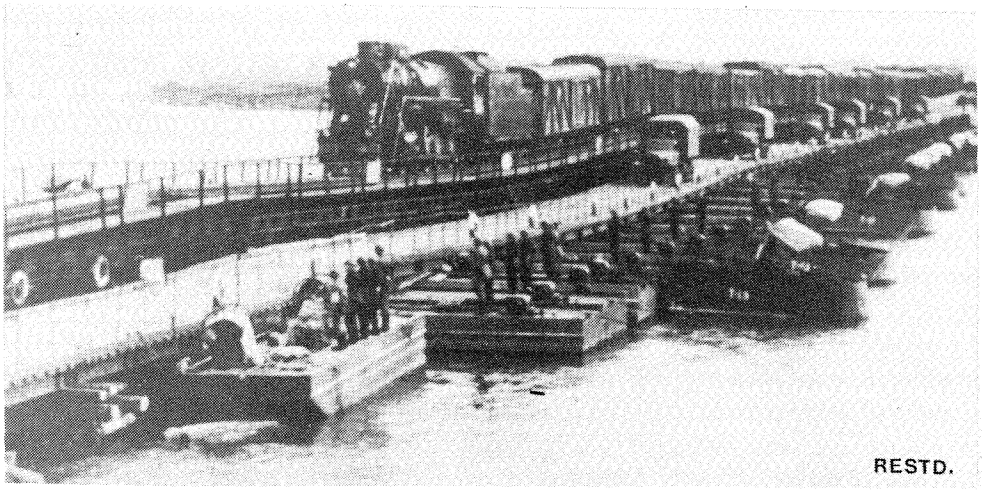


Fig 3. NZhM-56 Road and Rail Bridge

A separate line of development was the "bigger and better" approach which resulted in the NZhM-56 (Fig 3) pontoon bridge capable of taking road and rail traffic simultaneously. This used 26 metre tripartite pontoons with the HVS-16 adjustable trestle piers (Fig 4).

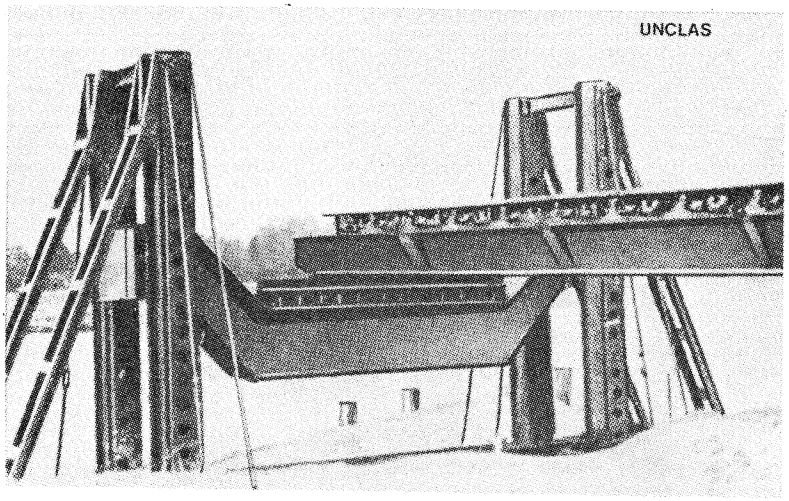


Fig 4. HVS-16 Adjustable Trestle Pier

Other significant advances seem to be the result of the extensive development effort put into the improvement of road and rail communications in Siberia. Initially this effort was devoted to the production of mechanised railway track layers; it was not a big step forward from these to producing similar machines for emplacing mechanically a prefabricated bridge span. (Fig 5).

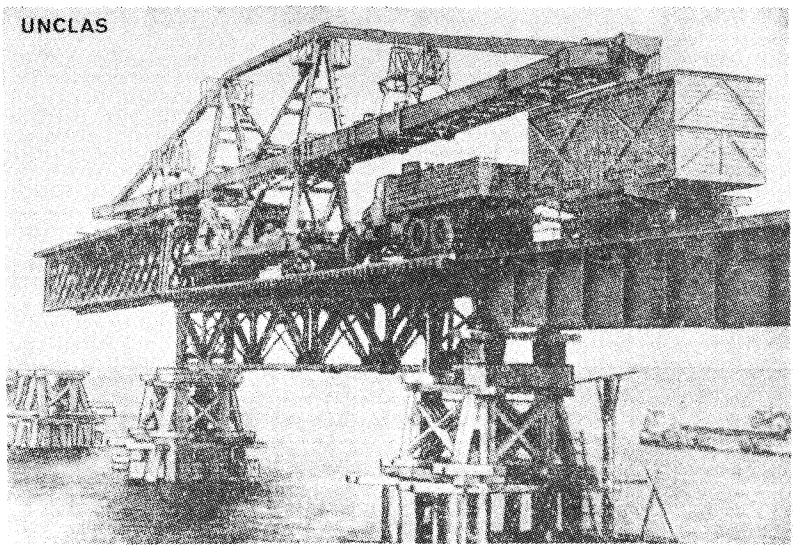


Fig 5. SRK-50 Rail Mounted Crane

Some of these large equipments may be unsuited for Western European railways with their many bridges and tunnels, but the SRK-50 rail mounted crane can be dismantled to ease rail movement to some extent. It is claimed it can emplace spans up to 33 metres in length and weighing up to 50 tons.

The next logical step was the development of special military bridging equipment designed for mechanical emplacement, and with its own integral folding trestle piers. This would reduce building times still further.

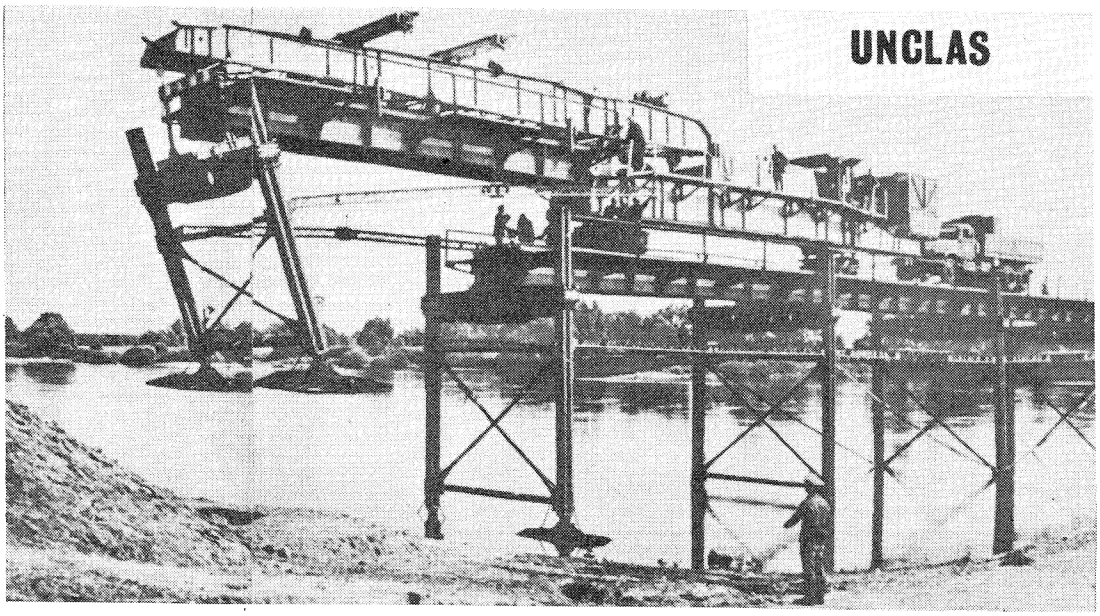


Fig 6. RAM-500 under construction

Fig 7. The RAM-500 in use

The bridge, known in the East German Army as the RAM-500, (Fig 6) is probably a joint East German-Polish-Russian project and is in use with all three armies.

Speed of construction has of couse to be paid for in increased cost and sophistication and in limited performance. With RAM-500, the individual spans are only 12.5 metres long, and the trestle piers can only be used in currents up to 1.2 metre/sec and in water up to 7.0 metres deep.

The most recent innovation publicised by the East Germans is the SBG-66 box beam road and rail bridge (Fig 8), which is probably also in use in other Warsaw Pact armies.

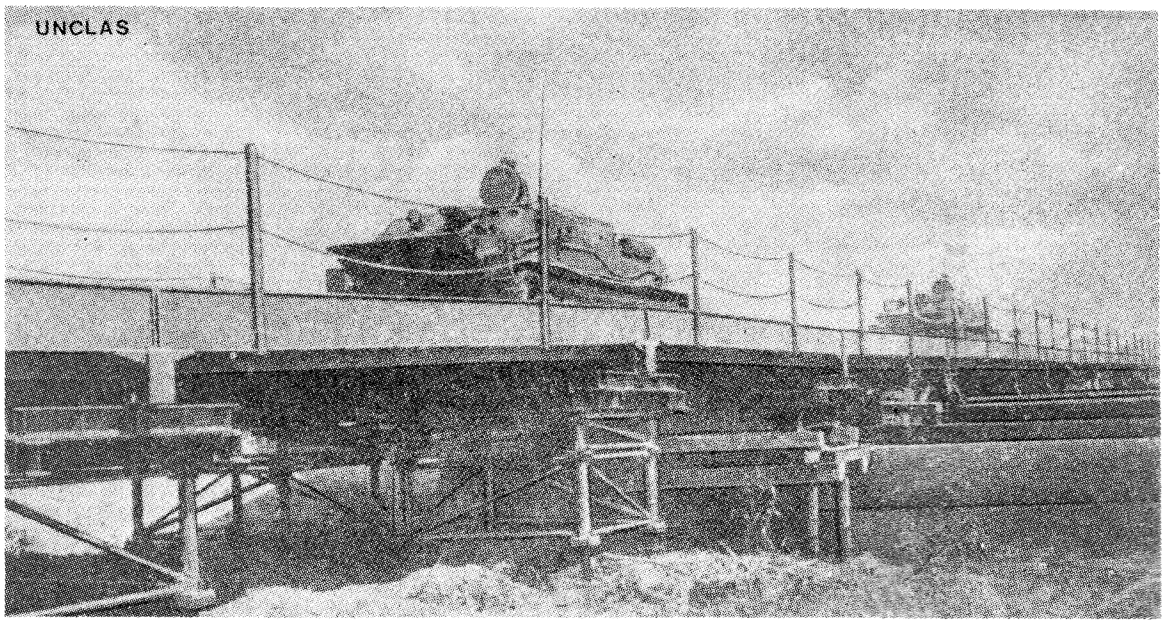


Fig 8. SBG-66 Beam Road and Rail Bridge

This appears to be a reversion to the earlier pattern since it is a much simpler but very versatile bridge suitable for prefabrication and emplacement by mobile cranes. It will not necessarily suffer from the same movement restrictions.

SBG-66 can be used for both road (load capacity 80 tons) and rail traffic. Although the maximum span is only 8.5 metres, it is suitable for use with existing standard equipment trestles. It can also be used with pontoons and river barges and as a ferry over river obstacles.

Conclusion

The heavy Soviet investment in bridging, of the sort described, illustrates the importance they attach to keeping open their lines of communications.

5. Soviet Methods of Producing Battlefield Smoke

Introduction

The Soviets plan to utilize smoke in the tactical battle for two main purposes. First, it is used to blind enemy OPs and fire positions, especially anti-tank weapons. Secondly, it is frequently incorporated as part of the deception plan to conceal the nature of an attack and the direction from which it is coming. This is especially true for river crossings and minefield breaching operations. This article details methods of smoke delivery available to the Soviet field commander.

Tanks and APCs

Fig 1. T-62 Making Engine Smoke

Until the introduction of T-55, smoke screens were achieved by activating smoke canisters attached to the rear of the tank. These had the obvious disadvantage of a limited duration. T-55/T-62 and more recently BMP have an integral smoke generation system incorporated in their design. The smoke screen is created by injecting diesel fuel into the exhaust manifolds, which causes vaporization of the fuel and results in a thick white smoke. The smoke can be emitted for between five and ten minutes, at which time the manifold cools to the extent that the diesel cannot be vaporized. The system can again be used after a three minute pause. Fuel consumption is about 10 litres per minute. Figs 1 and 2 show these vehicles producing smoke screens. Their main uses are to conceal troops behind the leading elements in an assault and to provide protection to motor rifle troops whilst disembarking from their BMPs. The aim is that only one tank is exposed when crossing in echelon, as can be seen in the illustration but AFVs laying the screen must frequently be silhouetted by their own smoke. Perhaps our motto should be: "Where there's smoke . . . . .FIRE!"

Soviet tanks do not have smoke canister dispensers, such as have been fitted to UK AFVs for many years, and therefore lack the capability of masking themselves if they have to reverse rapidly out of danger.

Fig 2. BMP Making Smoke to Cover Mounting Troops

Artillery

In addition to the primary artillery usage of smoke for blinding enemy positions or for deception, the Soviets use smoke to identify or mark targets and to assist in ranging under difficult conditions, Smoke shells are available in all calibres of field artillery and mortars, possibly including multi-barrelled rocket launchers. The latter equipments have such a high burst fire capability that it would make them very suitable for dispensing this type of shell.

Several chemical agents are available for generating smoke but white phosphorus (WP) mixed with TNT is probably the filler most frequently used by Soviet artillery. This has an additional incendiary effect which can cause ground fires or burn clothing and equipment.

Helicopters

The Soviets may have a WP smoke warhead for the S5 57 mm air-to-surface rocket. The S5 rocket is carried in four pods each containing 16 rockets on the HIP Mi-8 and in four pods each containing 32 rockets on the HIND-A Mi-24. There are other helicopters that also carry rockets. Each pod can probably carry a mix of HE, HEAT and WP rockets. The pilot is able to select the type of rocket to be fired. The Soviets have also experimented with dropping smoke generators (BDSh-5 and BDSh-15) from helicopters. The helicopter most suited for this role is the HIP Mi-8 (Fig 3). A chute made from metal tubing is used to drop the smoke generators. The Soviets claim that one helicopter carrying 24 generators can lay a smoke screen along a front of up to 5 km in two minutes.

Fig 3. HIP (Mi-8) Helicopter – Used for Dropping Smoke Generators

Smoke Generators

The Soviets use many types of smoke generator for large tactical screens and for the protection of point, static targets and special operations. They range from small hand-grenade type devices to a vehicle mounted generator. The grenade (RGD-2) is similar to a thunderflash in appearance and operation. It burns for 1.5 minutes and can effectively screen an area 8 x 20 metres (approx). They have a canister (DSh-100) intended for larger-scale operations. It is ignited by an electric initiator and burns for about 10 minutes. The BDSh-5 generator mentioned in the helicopter paragraph can be ignited electrically or with a percussion fuze. It burns for about 10 minutes and covers an area of some 4000 square metres. The largest is a generator mounted on a GAZ-63 truck (Fig 4). This equipment can cover an area about 1000 x 100 metres with dense white smoke. Sufficient fuel is carried for 4 hours continuous operation.

Fig 4. BDSh-5 Smoke Generator

Conclusions

The Warsaw Pact attach great importance to the employment of smoke in offensive and defensive operations, as is evidenced by the large range of equipment they have for dispensing it.

6. Soviet Sound Ranging System SChZ-6M

The current Soviet sound ranging system, the SChZ-6M, is based on the earlier SChZ-36 which was used with great success throughout World War II; the Soviets claim that SChZ-36 was responsible for 90% of all locations of enemy artillery batteries between July 1943 and April 1945. Today, SChZ-6M is the most important ground-based locator of enemy gun batteries, as it does not depend on line-of-sight.

SChZ-6M was introduced after World War II. Its main characteristics have been known for some time and were described in ATIR 92 of January 1969. But recent information has enabled us to analyse the system in greater detail and to examine its strengths and weaknesses more closely.

The System

Fig 1. The Microphone

The SChZ-6M system consists of four or six microphones (Fig 1) connected in pairs by line to form two or three sub-bases. Each sub-base is connected by line, there is no radio link, through a microphone control instrument (Fig 2), which permits the passage of both telephone speech and sound pulses to the pen-recorder (Fig 3) at the command post (Fig 4). The pen-recorder is controlled by an instrument at the advance post (Fig 5). The whole system is laid out as shown in Fig 6.

When the sound of a mortar or gun is heard by the advance post detachment, a button on the control instrument is pressed which starts the pen-recorder. A few seconds later, the sound arrives at each microphone in succession and pulses from each microphone are passed through the line to the pen-recorder which records each on a time trace. The distances between the pulses on the trace indicates the difference in time of arrival of the sound at the microphones and this enables the command post crew to calculate the coordinates of the target.These can be determined either graphically or by calculation. The latter is more accurate but is slower and requires more preparation.

SChZ-6M Sound Ranging Equipment

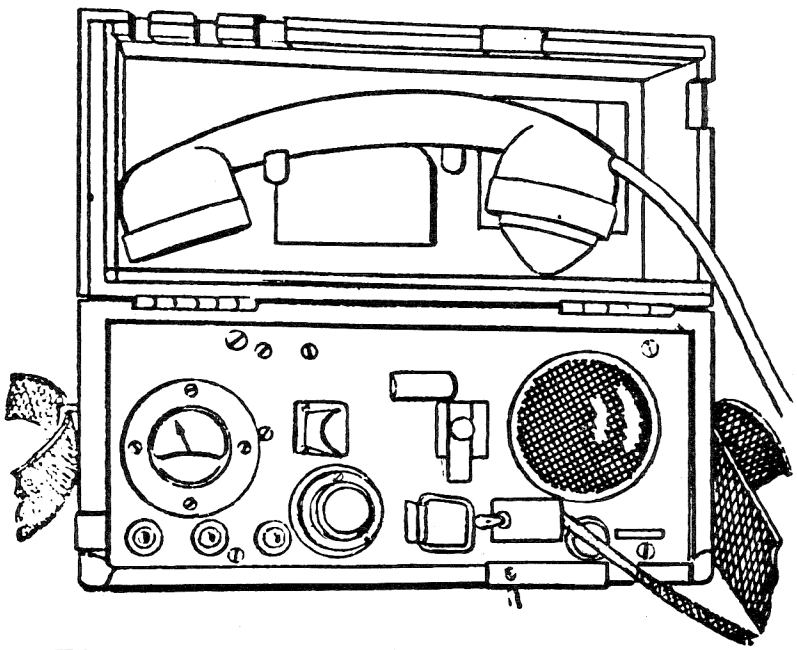


Fig 2. Mike Control Device

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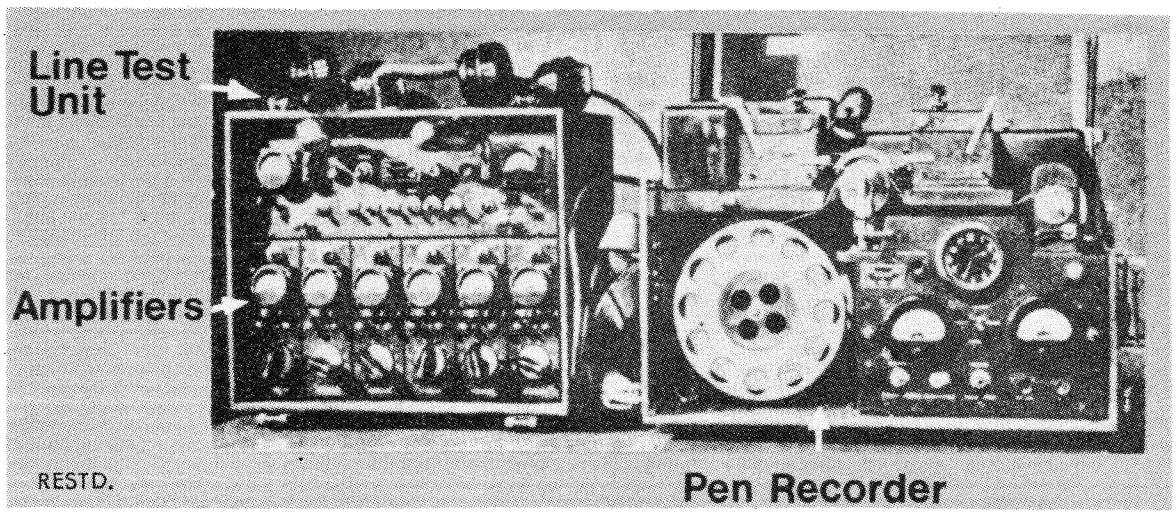

Fig 3. Pen Recorder

Fig 4. Command Post At Work

SChZ-6M Sound Ranging Equipment

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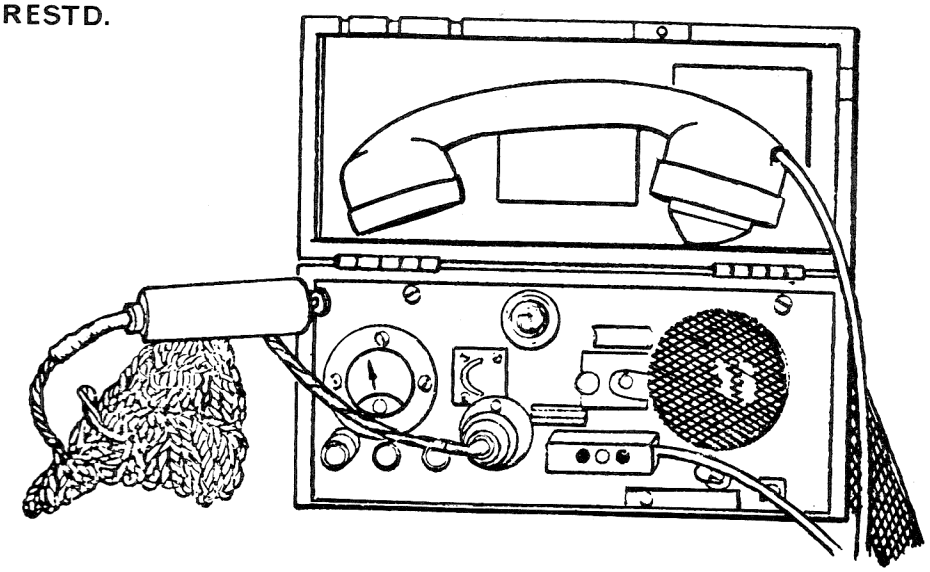

Fig 5. Remote Control Activator

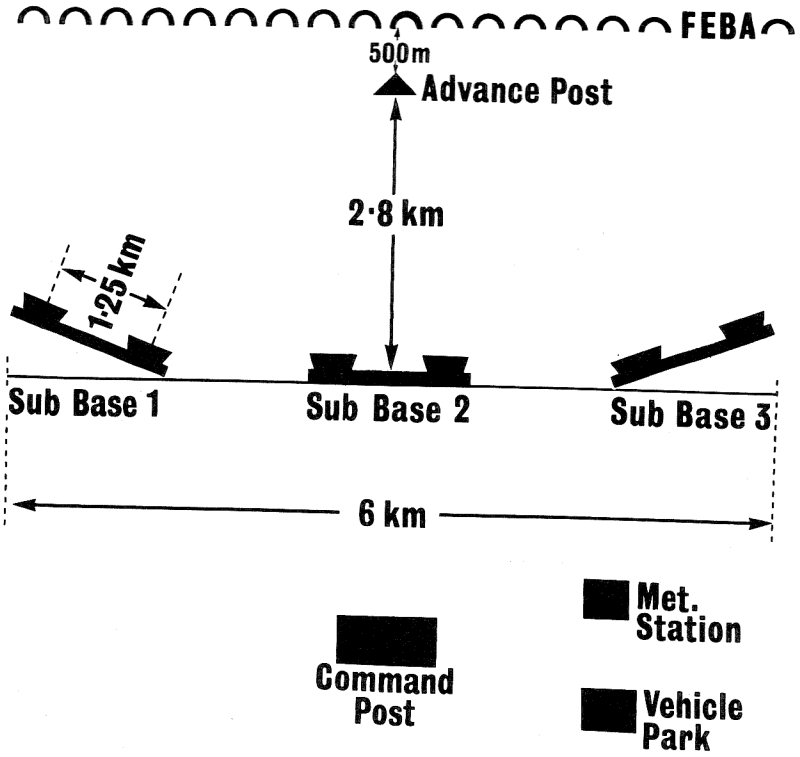

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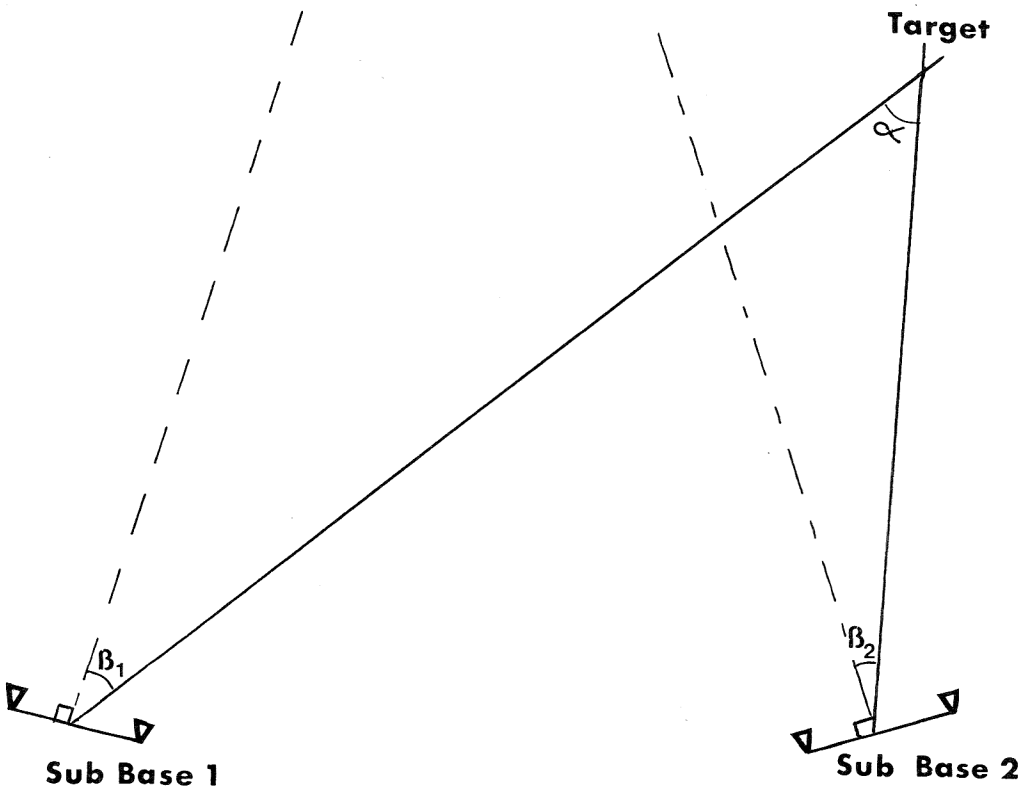
Fig 6. Layout of Sound Ranging System

SChZ-6M Sound Ranging Equipment

Performance

The system is not particularly accurate when compared with Western systems. The Soviets claim that it is capable of producing coordinates to an accuracy of 40 m in azimuth and 100 m in range at a range of 10 km, provided several conditions are met. Some of these conditions are obvious, for example survey must be complete and a good trace on the pen-recorder is necessary. But two of these conditions impose severe restrictions and these concern the angles of the bearings to the target from each sub-base, as shown in Fig 7. The angle alpha must be no less than 30°, and the angles beta must be no greater than 40°. These conditions mean that the system can only produce accurate coordinates within a very small area, examples of which are shown in Fig 8.

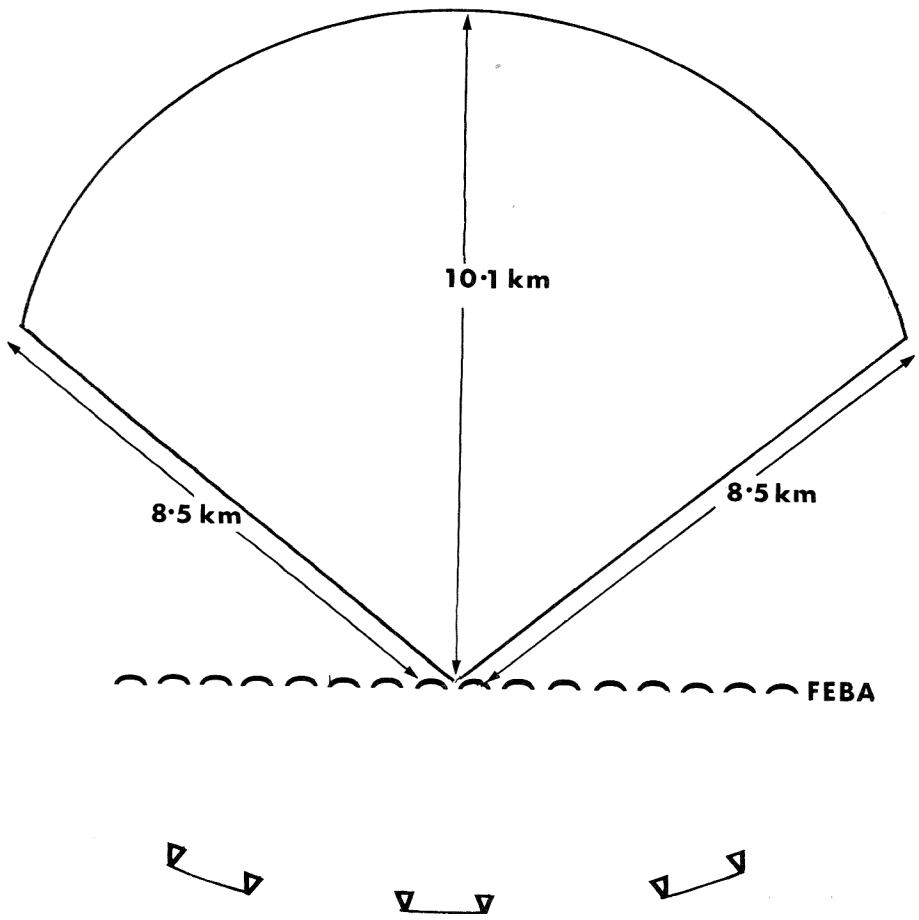


RESTD.

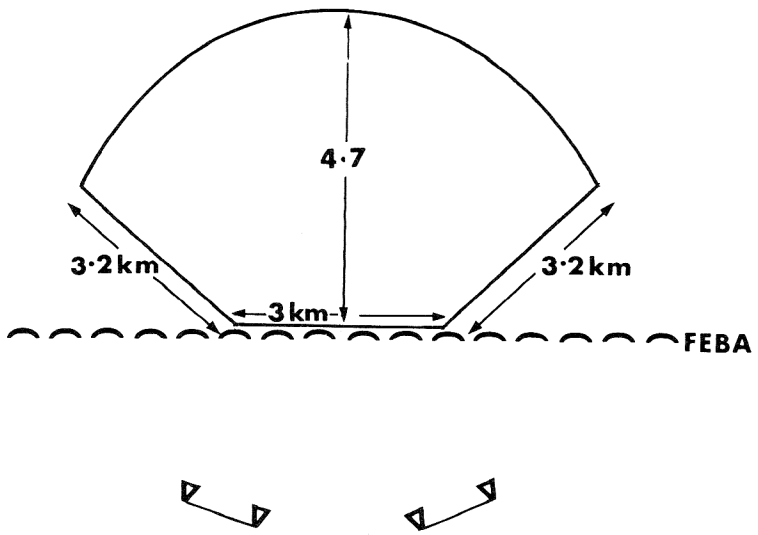
Fig 7. Angular Conditions for Accurate Results

Note: For accurate coordinates, Alpha – not less than 30°, Beta 1 and Beta 2 – no greater than 40°.

SChZ-6M Sound Ranging Equipment



a. Coverage for a 3 Sub-base 7 km Layout



b. Coverage for a 2 Sub-base 4 km Layout

Fig 8. Accurate Coverage of SChZ-6M

SChZ-6M Sound Ranging Equipment

The range at which accurate coordinates can be produced is limited by the accuracy described on page 22. Outside this area, approximate coordinates can be obtained in good acoustic conditions to the following ranges:

Against an 81 mm mortar:		4 to 5 km
Against a 105 mm gun	:	12 to 15 km
Against a 155 mm gun	:	20 to 25 km

Approximate coordinates will inevitably increase the time of effective reaction as the rounds may need considerable adjustment onto the target.

The deployment of the system is slow for two reasons. First, time is required to lay the cable between the various component parts of the system. Second, each microphone has to be accurately surveyed in, which may take as long as 4 hours, although less accurate survey could be carried out in about half an hour.

Little is known about the time taken to produce target coordinates. This will depend on acoustic conditions, which, if bad, will make the trace from the pen-recorder difficult to read and slow to interpret. However, the Soviets claim that it takes between eight and twenty minutes to produce the coordinates. It must also be remembered that the artillery rounds may also be adjusted onto the target and this will add several minutes to this time, as will the passage of the coordinates to the guns.

The Future

There is little likelihood of the Soviets producing a new sound ranging system. The SChZ-6M is likely to be replaced in due course by a gun locating radar, probably between 1980 and 1985, and this would give improved accuracy and speed of deployment and reaction.

However, it is expected that SChZ-6M will be modified. The most likely modification is the replacement of line by radio link, or at least the provision of radio link as a complement to line. This would cut the deployment time drastically and enable the system to produce approximate coordinates within about half-an-hour, although the production of accurate coordinates would still be delayed by the time taken for full survey. Radio link would be less vulnerable to physical damage, but line might well be retained as a secondary link in ECM conditions.

SChZ-6M is likely to remain in service for another five or ten years in the Soviet forces and for longer in non-Soviet Warsaw Pact armies. During this time it will be a major and effective means of locating NATO guns and mortars.

7. FWUA-100 Series Soviet NBC Collective Protection System

Increasing numbers of Warsaw Pact B vehicles are fitted with systems designed to protect the occupants from NBC contamination. Many signals and workshop box bodies are so fitted, but other types such as command vehicles may also be protected. The systems vary from country to country, and variations of some individual systems exist. Soviet collective protection systems are generally based on a standard NBC filter.

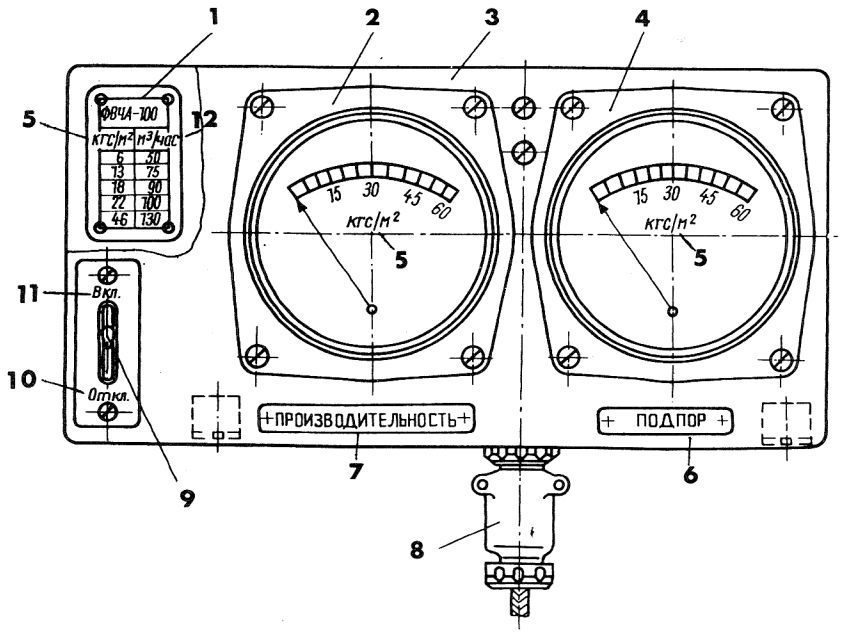
The principal components of a typical system are illustrated by the FWUA; 100N-12 system shown installed on the MTO–AT workshop body in Fig 1. A control panel is located inside the body.

Fig 1. FWUA-100N-12 Collective Protection System

The fan is driven by a 12V 120W electric motor. When the system is switched on the fan draws air through a pre-filter which contains a replaceable filter element. The pre-filter removes particulate matter from the air and thus provides protection against radiological contamination. From the fan the air passes through the absorption filter. This contains a dust filter and an activated charcoal absorption filter and removes all toxic vapour from the air. From the filter the air passes through an inlet valve into the box body.

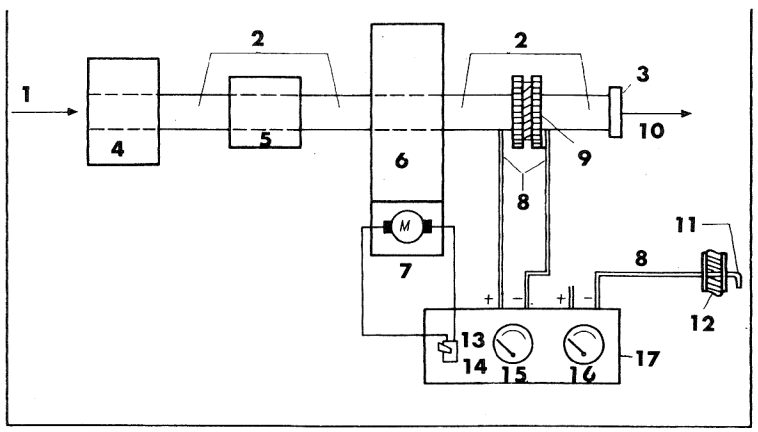
The system is controlled from the operating panel shown in Fig 2.

A schematic view of the layout of the system is shown in Fig 3.



1 Conversion Table
2 Flow Meter
3 Case
4 Manometer
5 Kg/m^2
6 Head (of water)
7 Output
8 Electric Connection
9 Operating Switch
10 Off
11 On
12 m^3/h

Fig 2. FWUA-100N-12 Control Panel



1 Air Intake
2 Air Connection Pipe
3 Locking Cap
4 Pre-filter
5 Absorption Filter
6 Fan
7 Motor
8 Rubber Tube
9 Membrane
10 Air Outlet
11 Connection with outside air
12 Box Wall
13 On
14 Off
15 Flow
16 Pressure
17 Control Panel

Fig 3. FWUA-100N-12 Layout of System

Before operation the components are checked for leaks and correct sealing. The doors and windows of the body are tightly closed to reduce leakage to a minimum. The fan is then switched on by the main switch and pressure is allowed to build up inside the system for 30–50 seconds before the inlet valve is opened to allow air to enter the body. The pressure is measured by the left hand dial on the control panel in kg/m^2 and the flow in m^3/h can then be read from a conversion table. The valve is then adjusted to give the desired air flow into the body (maximum 75 m^3/h). The right hand dial shows the excess pressure within the body in kg/m^2. It is possible to run the system at a flow rate 25% greater than the rated maximum if the sealing of the body is defective.

A device often seen apparently associated with the filtration system is the diesel oil fired heater shown in Fig 4.

The equipment comprises an air intake, fuel tank, a burner and chimney. The method of operation is not known, but it is probable that the heater is not used in a contaminated environment.

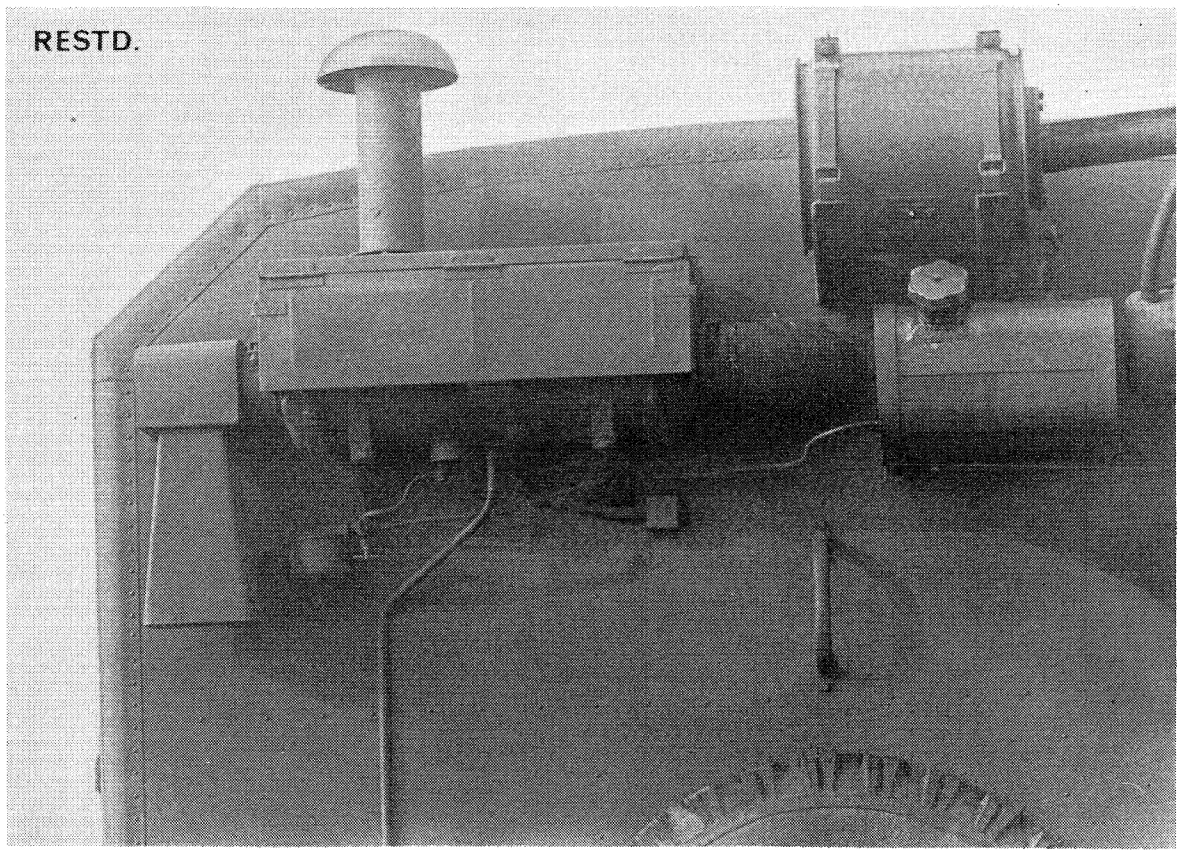


Fig 4. Diesel Oil-fired Heater

Apart from their obvious function of enabling technicians to operate unencumbered by protective clothing, collective protection systems can provide refuges in which troops can rest and eat in comfort and safety. The operational and morale benefits of such a facility could be important. The spread of collective protection is thus an indication of the Warsaw Pact's determination to be able to survive and continue operating in a contaminated environment.

8. Special Fittings on the Front of T-54/55/62 Warsaw Pact Tanks

Introduction

A proportion of T54/55/62 tanks have a variety of pads, clamps and other anchor points permanently fitted to the upper and lower glacis plates (see Fig 1). These are the points to which dozer blades, mine clearing rollers and ploughs are fastened. This article is intended to clarify what each of these appendages is for, to enable the observer to decide to which uses the tank could be put.

Fig 1. Anchor Points on T-62 Tank

Universal Fittings

Fig 2 shows a complete range of attachments which will enable all three types of front end equipment, and all marks of these, to be fitted to a tank. What they are for is described in the legend but it should be noted that variations in detail are possible.

Many of these anchor points are fitted to tanks during the manufacturing process, irrespective of the role for which the tank is destined, and perhaps therefore they are never used. Others are fitted in workshops using a modification kit after the tank has been allocated to a specialist task. Even troop tanks that might never have more than mine clearing ploughs fitted may have the whole range of anchor points welded on to them at this stage, though the reason for this apparently unnecessary labour is not known.

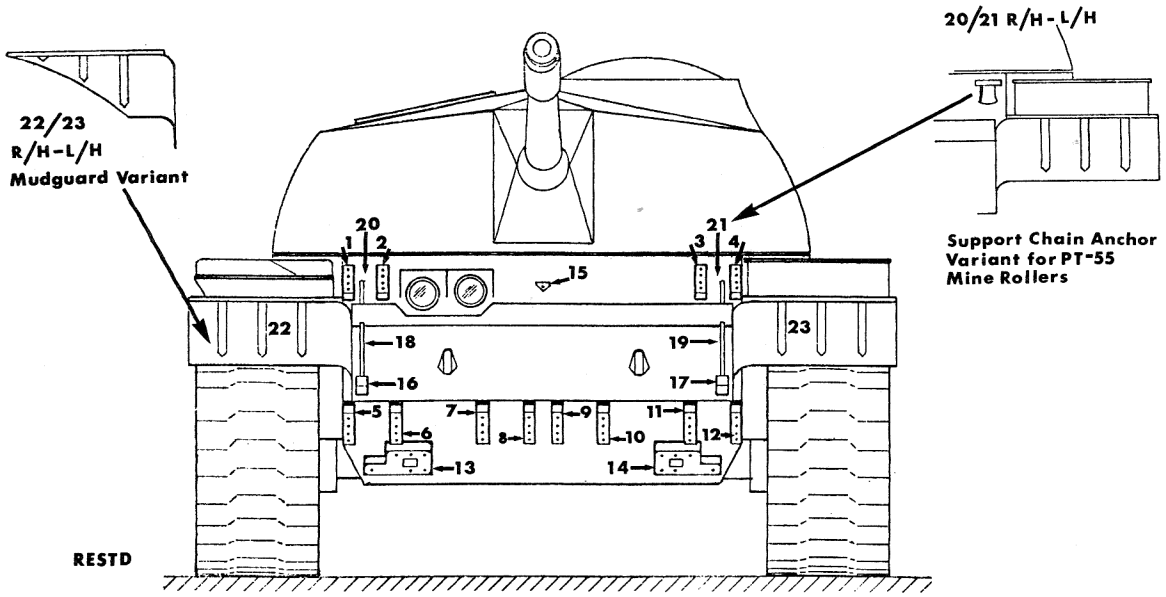


Fig 2. Basic Fittings for:— BTU-55 Dozer Blade
KMT-4 Mine Plough
KMT-5 Plough/Roller Combination

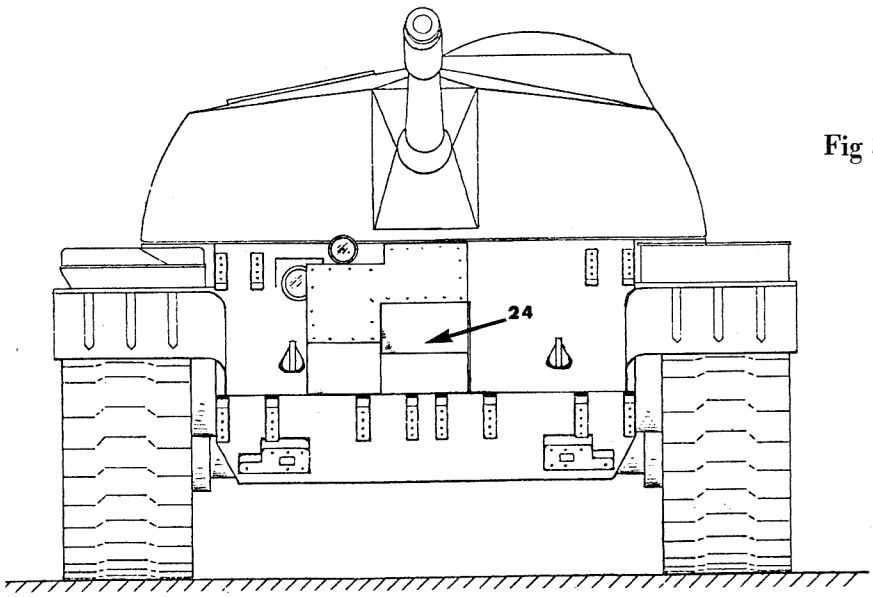


Fig 3. Electro Hydraulic Equipment for BTU-55 Dozer Blade

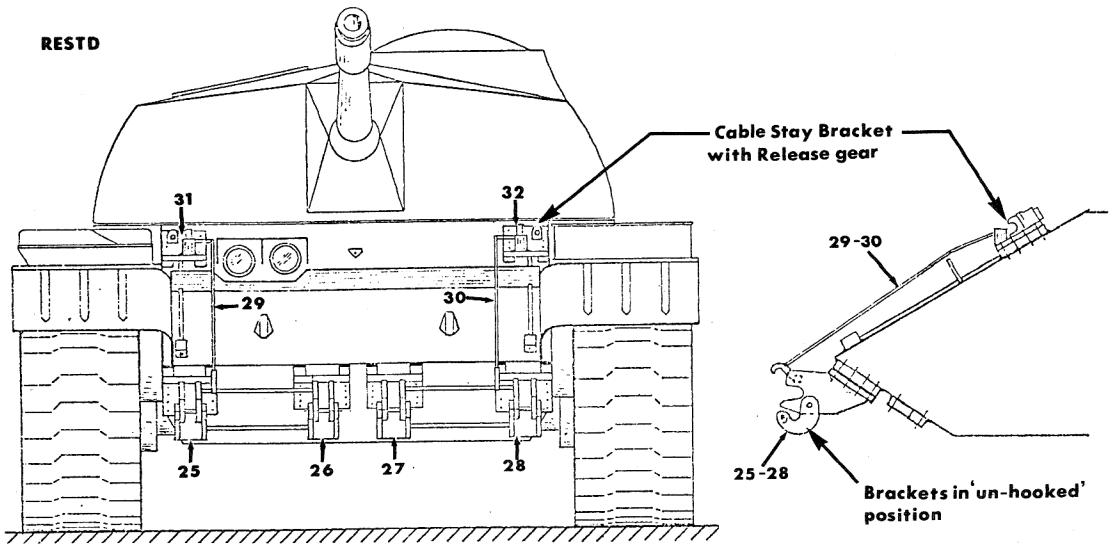


Fig 4. Attachment Bracket for KMT-5 Mine Plough/Roller Combination

Legend:— Figs 2, 3 and 4

Fig 2

1) 2) 3) 4)	**Pads**	To mount cable stay bracket with release gear for	KMT-5 Rollers
5) 6) 7) 8) 9) 10) 11) 12)	**Pads**	To mount push beam brackets for " " " " " " " " upper frame brackets and ram pivot for	KMT-5 Rollers PT-55 Rollers BTU-55 Dozer Blade
5) 6)	**Pads**	To mount bearing brackets for	KMT-4 Plough
11) 12)	**Pads**	" " " " "	KMT-4 Plough
13) 14)	**Pads**	To mount lower frame brackets for	BTU-55 Dozer Blade
15	**Clamp**	To mount electro-hydraulic equipment for	BTU-55 Dozer Blade
16) 17)	**Electric Sockets**	For release mechanism to lower	KMT-4 Plough
18) 19)	**Conduits**	Electric cable for release mech on	KMT-4 Plough
20/21	**Bollards**	Anchor for support chains on (may be replaced by pads 1—4)	PT-55 Roller
22/23	**Mudguard Variant**	Section cut away for ploughs	

Fig 3

24	Hydraulic fittings for BTU-55 Dozer. Note: Headlamp has to be re-sited and splash board removed when BTU-55 is being used.

Fig 4

25) 26) 27) 28)	**Brackets**	For fitting KMT-5 plough/roller combination (attached to pads (5 to 12))	
29) 30)	**Quick Release Rods** to brackets 25—28		
31) 32)	**Cable Stay Brackets** with release gear for		KMT-5 Rollers

BTU 55 Dozer Blade Attachments

Fig 3 shows the additional electro-hydraulic equipment which first has to be attached to the tank to enable a dozer blade to be used. Tanks are sometimes seen in this stage of preparation since it enables the fast mounting of a blade in the field when it is required. In this state it is unlikely that a plough or roller would be fitted.

Mine Roller Attachments

Fig 4 shows a tank fitted with the attachment brackets for the KMT-5 mine plough/roller combination. Tanks are frequently seen in this state because the final stage of fitting the rollers can then be done rapidly by the crew.

Summary

Many T54/55/62 tanks have a variety of anchor points for dozer blades, mine clearing rollers and ploughs fitted to their glacis plates, regardless of the role to which the tank is assigned. Tanks without these fittings cannot be used with this ancillary equipment but those which do have them are not necessarily anything but ordinary troop tanks. Tanks are sometimes seen with the basic attachments for dozer blade or rollers fitted so that these equipments can be attached more quickly when they are required, and this is normally sufficient to indicate the role for which the tank is destined.

9. BMP Reconnaissance Variant

The latest BMP variant to be identified is the reconnaissance version – BMP M-1976. This vehicle has a new two-man turret and mounts the same 73 mm gun as the standard BMP but does not carry a launch rail for a SAGGER missile. Both of the turret stations are equipped with optical devices for day and night surveillance.

The rear compartment is smaller than that of BMP and probably only contains two men. These men each have rotatable episcopes for observation but do not appear to have firing ports.

The vehicle is probably crewed by six men – the commander and gunner in the turret, the driver and radio operator forward of the turret and two men aft of it. Up to four could dismount for ground reconnaissance tasks.

This variant is probably replacing the obsolescent PT-76 light tank in divisional reconnaissance units.

FOREIGN ARMY EQUIPMENT QUIZ.. .. ..

Nine targets for you to shoot at.

Some unusual photographs to tax your intelligence knowledge.

Fig 1. Its an 8 x 8 but can you identify the vehicle. The Russians look rather puzzled – are you?

Fig 2. This isn't seen very often nowadays, can you say:—

(1) What it is?
(2) Where it comes from?
(3) What type of round is being loaded?

Fig 3. A sitting duck – you probably know the tank but do you know what kinds of ammunition are laid out beside it?

Fig 4. He looks as if he knows what he is operating – but do you?

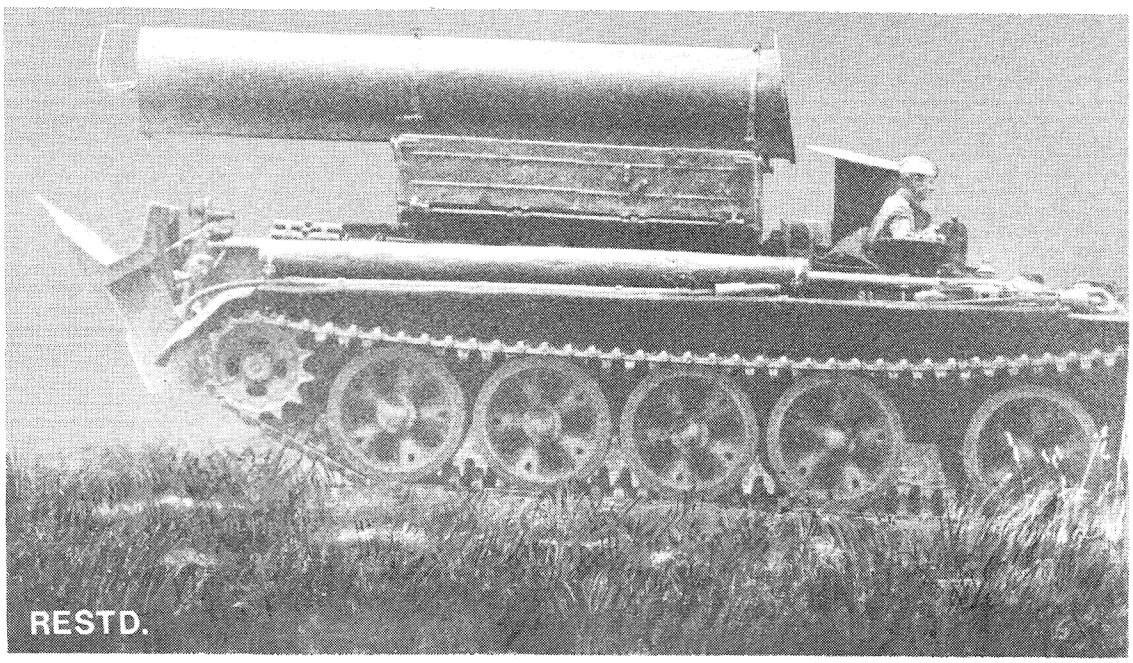


Fig 5. Missile Tank? Tracked Heavy Mortar? or!

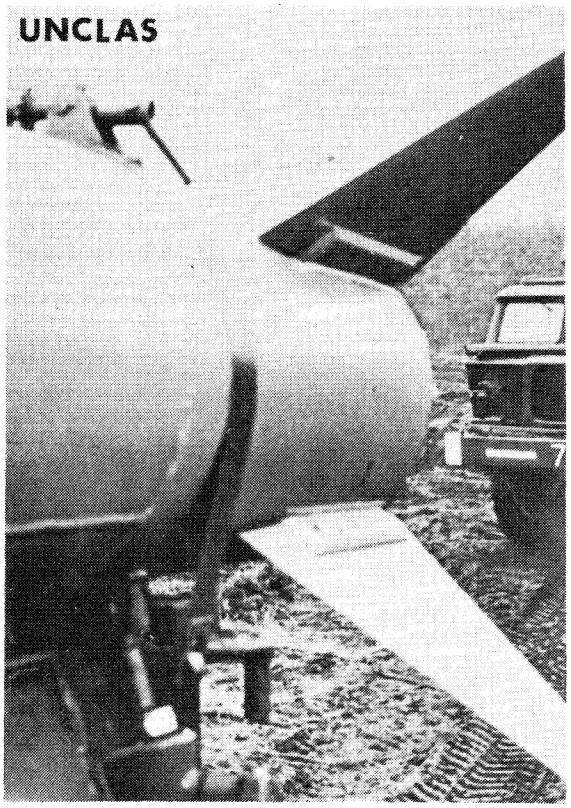


Fig 6. Fish or Reptile? Don't give up so easy — There is a good clue in the background.

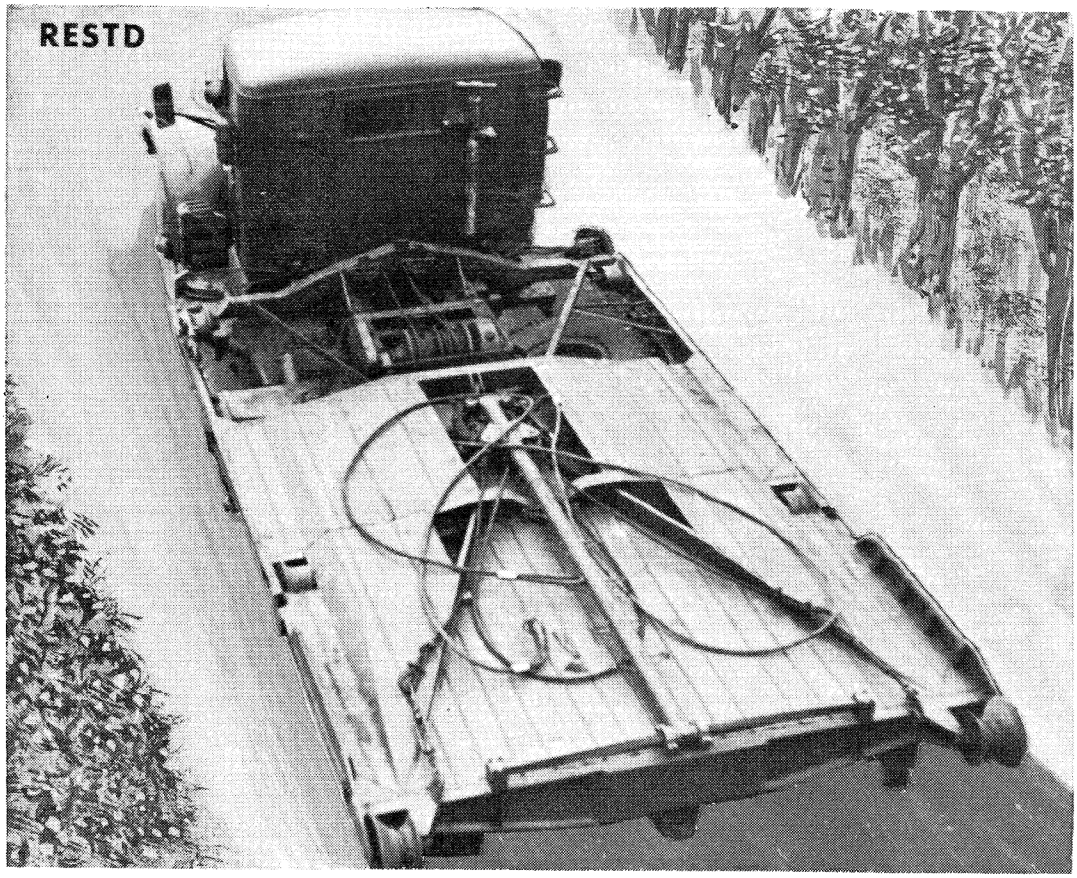


Fig 7. What was this vehicle carrying?

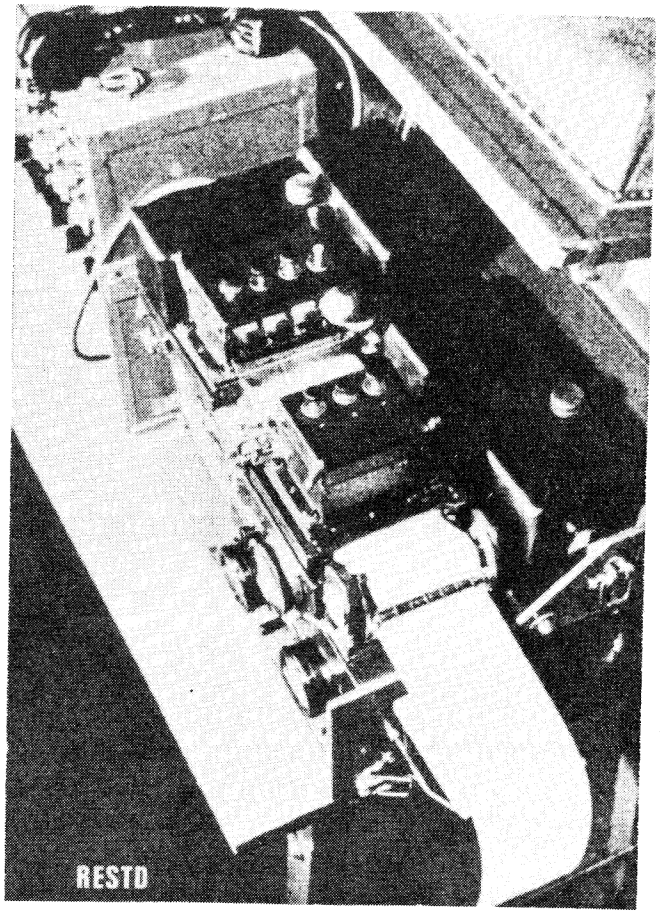


Fig 8. What on earth is it? You have just been reading about it.

Fig 9. All tucked up for the night!
What's under the covers?

Answers

1. Rear of TATRA-813 – 8 x 8.
2. (1) 82 mm Recoilless Gun M-59A.

   (2) Czechoslovakia.

   (3) HEAT.
3. T-62 Tank. The ammunition is

   (1) APFSDS.

   (2) HEAT–FS.

   (3) HE–FS.
4. R-107 VHF Manpack Radio Set.
5. ARV with Schnorkel.
6. Tail of FROG-7 Missile.
7. A PMP Pontoon.
8. Another view of the Pen Recorder in the SChZ-6M Sound Ranging Equipment.
9. SCUD-B.